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Educational innovation for the ecological assessment of the effectiveness of wildlife management

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Abstract

Research is devoted to solving complex aims: educational (the development of ecological competence of managers), and socio-economic (optimization of access to recreational resources) through the improvement of innovative algorithms, theory and practice of wildlife management. We also tried to identify the problems of integration of Natural and Human sciences as the problems of environmental education.This article contains a description of the elements of how to organize environmental management training in real situations. On the example of integrated assessment of the socio-natural potential (of the Caucasian Mineral Waters region) shows the role of manager's ecological competence in making optimal decisions that affect human values. The article emphasized that the possibility of society full of ecosystem services is directly linked to the idea of the uniqueness and intrinsic value of the natural world, whose safety should be regarded as a guarantee of human health.

Keywords: innovation technologies; ecological competence; wildlife management; safety of ecological and social interaction; SWOT-analysis; recreational potential; health.

Foreword

This research is devoted to solving social problems and educational training of modern management, taking into account the immanent nature of the environmental specialist expertise in every field. At the first stage the research was realized at university's basis *(Glazachev & Perfilova, 2008; Perfilova, 2006, 2009, 2010)*. Then the research's scope was expanded to include a research area of colleges *(Perfilova & Alizade, 2011)*.We are currently focusing our efforts on finding innovative algorithms of theoretical and practical improve the process of wildlife management optimization in accordance with the priority areas of science, technology and engineering in the Russian Federation *(Alizade, 2011)*.

1. Model of ecological education

Person's readiness to appropriate action to transform the existing society and nature of reality can be estimated by its level of ecological competence *(Glazachev&Perfilova, 2008)*. According to leading scientists, everybody should have the potential of the non-random vision of factors, threatening nature and society *(Anisimov, 2009)*.

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Model of ecological education taking into account the essence, structure, the conceptual framework of ecological competence; the social component of the category of "ecological competence» *(Raven, 1987),* especially in development of ecological competence of the specialist in professional activities. It is proved that the ecological competence has trans-subject and meta-subject features, and becomes the criteria of professional competence of any specialist *(Glazachev, 2010)*.

1.1. Technologies for ecological education of managers

Researches of recent years show that the achievement of the modern socio-cultural development, called the "Millennium Development Goals" (poverty alleviation, care of children and women, create conditions for the full human potential) is directly related to the effectiveness of humanitarian technologies, bringing together experts and practitioners in solving complex problems of improving the quality of human life in general *(Glazachev, 2010).* This concept is a system that determines the integrative scientific and practical applications and managerial effort. From this perspective, an ecological approach for management is considered in the traditional sense of the word as ecology studies the problem of co-evolution of nature and humanity, the preservation of natural diversity on our planet, wildlife protection. In the wide sense we can speak about the ecology of people activities and of the governing influence on complicates systems, based on the “To think globally, to act locally” principle. In all this cases we are talking about the Man and the world around him *(Knyazeva, 2009)*, due this the modern manager must navigate the issues of effective management in the system "Man-Nature-Society” on developing of a strategic matrix.

1.2. Educational standards

For the realization of complex social programs, modern managers must have competences of ecological assets in their professional active, allowing to make optimal decisions at the level of human values and interests of the individual, society and state. Content of University education standard of Russian Federation (Ecology&Wildlife Management) presented in tab.1.

Table 1. Content of University education standard of Russian Federation (Ecology&Wildlife Management)

Special subjects of natural science units	Special humanities block	Information & communication sciences	Special workshops	Elective courses
geo-ecology, geography, geology, biology, chemistry, general ecology, natural resources	anthropo-ecology, social ecology, ecological psychology, environmental law, economics, environmental manag.	IT-technology, geo-information systems, foreign languages	expeditions, environmental monitoring, environmental assessment, PR-projects	on the ecological culture of peace; on global environmental issues

Such discipline as “Elements of Ecology” is also included in the standard of education of students with non-core majoring specialties (incl. Management, State&Municipal Administration, Jurisprudence etc.). The mandatory education standard for college students, majoring in Management, comprises also “Ecological Elements of the Environmental Management”. Sometimes academic subjects are translated by lecturers only from the position of natural sciences (biology, chemistry etc.), without taking into account the humanitarian compound of the environmental knowledge, hindering the formation of the ecological world outlook at college students. The situation is problematic, if the ecological education (in colleges) is also improperly referred only to the category of natural sciences. But the formation of the ecological culture and ecological competence is more and more realized as the field of application of humanitarian technologies *(Perfilova&Alizade,2011).*

2. Methodology of organizing environmental training of managers in real situations

The effectiveness of ecological approach in the management of social optimization of access to recreational resources will be demonstrated by a comprehensive assessment of the capacity of the Russian region Caucasus Mineral Water (CMW).

2.1. Range of possible educational aims

- education (the development of ecological competence of managers);
- socio-economic (for example, optimization of access to recreational resources);
- scientific (description & forecast)

2.2. Retrospective analysis

Unfavorable situations that create ecological problems affect on quality of enviroment and the health of population *(Kofler, 2007).* Retrospective analysis shows how the evolution against the background of the concept of "human health" cardinal changes the system of state planning and control, improved line of research. Since 1931, Russia began construction of a resort "health factories", and the concept of "prevention of disease" came to lexicon of professional managers. At present time, Russia has a multi-tiered system of state social insurance under which implemented the federal law that provides citizens with permits providing for medical treatment.

2.3. Geo-ecological description

The investigated region is geographically and geologically quite extensive. In the South – it is the foothills of Mount Elbrus, the valley of the rivers Hasaut and Malka; in the West - the upper reaches of the rivers Eshkakon and Podkumok. The northern boundary of the district is Mineral Waters city, which begins in the steppe zone of Caucasus. Through the territory of the region there are electrified railway line Moscow - Baku, with branches in Kislovodsk and Zheleznovodsk, the state paved highway Rostov - Baku. Airport in Mineral Waters city connected by direct airlines to all major centers in Russia and many foreign countries. Resort region Caucasus Mineral Waters is located in the Stavropol region, and includes well-known resorts in the country: Kislovodsk, Pyatigorsk, Yessentuki and Zheleznovodsk. The uniqueness of the resort region due to an exceptional variety of types and different visibility of mineral waters, deposits of which are relatively compact concentrated on not large area of territory. On a variety of mineral waters region has no equal, not only in Russia but also in all world (tab.2).

Table 2. Comparative analysis of mineral waters in the CMW region

Natural deposit	Chemical composition (g/dm^3)	Mineralization (g/dm^3)	Type of therapy	Reserve (m^3/per day)	Ref.
Kislovodsk	CO_2 1,0-3,0	1,5-5,0	drink healing, bath treatment	2000	
Essentuki	CO_2 1,0-3,0	7-10; 10-15	-‘’-	800	
Pyatigorsk	water ion complex	4,0-8,5	drink healing	3000	includ.
		4,5-5,5	drink healing, for external use		Radon
		7,5-12,0	drink healing		waters
	Rn 230-330	1,0-1,5	bath treatment (for external use only!)		706
	Rn 70-80	2,0-4,0	-‘’-		
	Rn 15-40	2,5-3,5	-‘’-		
Zheleznovodsk	CO_2 0,8-1,6	3,0-4,0	drink healing, for external use	2000	

Also, there is one of the best Russian curative mud deposits – Tambukan Lake (tab.3).

Table 3. General characteristics of the deposit of silt mud of Tambukan Lake

Location	Chemical composition (g/dm^3)	Mineralization (g/dm^3)	Reserve (m^3)	Production volume (m^3/per year)	Number of medical seats	Ref.
15 km from Pyatigorsk	FeS > 0,5%	30-70	900 000	1 500	600	the world's largest mud SPA-therapy clinic

In addition to mineral water and mud, a resort region Caucasus Mineral Waters has a great diversity of landscape and climatic features due to mountainous terrain and complex combination of geomorphological zones. Especially in this respect stands resort of Kislovodsk, where climatotherapy applies equally to the balneotherapy. Location Kislovodsk in the medium-zone, at an altitude of about 800-1100 m, surrounded by mountain ranges covered with alpine meadows and mountain steppes, promotes the formation of a special micro-climate, characterized by an abundance of sunny weather, increased ultraviolet radiation-resistant weather patterns, reduced atmospheric pressure and high ionization. In Kislovodsk, there are up to 185 days with a particularly favorable, and 117 days with relatively favorable conditions of climate.

2.4. Special description

A variety of mineral waters, the presence of high-quality mud treatments, use for medician purposes of the climate led to the wide range of medical indications for the region in general and specialized medician profile of each of its resorts (fig.1). This allows us to successfully implement the prevention and treatment of diseases, as well as relief of premorbid states of health.

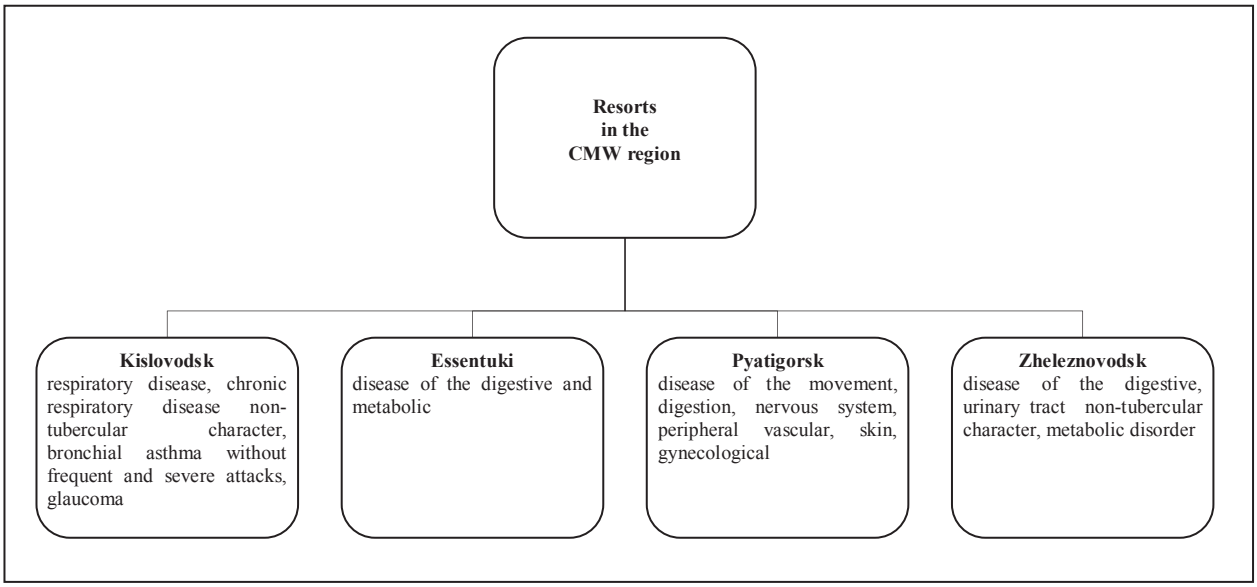

Figure 1. The main specialization profile resorts in the CMW region

2.5. Comprehensive analysis

Due to the necessity of solving problems is an adequate socio-natural interactions, modern managers must understand the danger of natural and social risks in conducting SWOT-analysis of the strengths, weaknesses, opportunities and threats.External analysis involves the analysis of the macro- (indirect influence) and micro- (direct

influence). The set of analyzed areas of macro-ecological sphere is considered as a factor in long-term development. A similar integrated approach has been applied in the management of the development of ecological assessment of the effectiveness of the project's algorithm, which involves determining the possible economic impact of environmental pollution *(Alizade, 2010, 2011)*. The scheme of comprehensive analysis of the recreational potential of the resort CMW region presents in the tab.4.

Table 4. The scheme of a comprehensive analysis of the recreational potential of the resort CMW region

Items to compare		Characteristic of the object
Political and administrative	State & territorial identity	Russian Federation, Stavropol region
	Area of the region	3031,5 km^2
	Type of infrastructure	resort towns
	Administrative division	4 district center of regional submission: Kislovodsk, Essentuki, Pyatigorsk, Zheleznovodsk; Tambukan Lake (Natural)
Resource	Uniqueness	largest in the world / the world's only
	Natural resource	mineral waters, silt mud, highly-ionized air, high insolation, hippo-fauna
	Social & cultural resources	medical staff, service staff, consumer service, aesthetic & cultural attractions
Prognostic	Specialization of use	SPA-therapy, hydro-therapy, climate-therapy, wellness holiday, free holiday, tourism
	Season of use	all-season, all year
	Level of social needs of	very high
	Medium-term development	relatively favorable
Investment	Investment demand	Low
	Investment attractiveness	Medium
	Possible factors of investment risks	ethnic tension, socio-economic instability, natural anomalous
	Reduce the probability of investment risk factors	Medium

Thus, the possibility of society full of ecosystem services, including recreation, directly related to the paradigm of self-worth and uniqueness of the idea of the natural world, whose integrity must be considered as a guarantee of human health.

Opinions:

The introduction of educational innovations to optimize the socio-natural interaction model will be more effective if:
- algorithms of ecological education of managers will be developed taking into account the possibility of their practical application in real situations;
- the theory of process of wildlife management (as an element of fundamental training of bachelors and masters) will be studied at universities in the synthesis of natural and human sciences;
- key-study (for programs of bachelor's and master's degrees) will take into account technology, monitoring and management of the environment, prevent and eliminate pollution ("critical technologies").

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